REMARKS

The Office Action received on October 29 2007 has been carefully reviewed by the applicant.

In the Office Action claims 1, 3, 6, 7, 10, 11, 16, 18, 20, 21, 23-27, 29, 31-41, and 43-54 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Roehrig et al. U.S. Published Application 2002/0097902 (Roehrig) in view of Ema et al. U.S. Patent No. 5,779,634 (Ema) and Rogers U.S. Patent No. 6,970,587 (Rogers).

Claims 14 and 42 are further rejected under 35 U.S.C. §103(a) as being unpatentable over Roehrig in view of Ema, Rogers, and Ozaki et al. U.S. Published Patent Application No. 2006/00650943 (Ozaki).

The Examiner has also objected to claim 16 due to informalities and claims 20, 41 and 48 under 37 C.F.R. §1.75(c) as being improper dependent form for failing to further limit the subject matter of a previous claim.

By the present amendment, claims 3, 10, 20, 26, 27, 29, 31-34, 41, 42, and 52-54 have been cancelled and new claims 55-58 have been added.

Claim Objections

Claim 16 has been amended to claim "the processor modifies the visual display of the marker and stores an image file..." By this amendment of the word "states" to the word "stores" the claim is definite and the Examiner should lift any objection to this claim.

Claims 20, 41, and 48 have been objected to under 37 C.F.R. §1.75(c) as being of improper dependent form. Claims 20 and 41 have been cancelled thereby rendering these objections moot. With regards to claim 48, presently amended claim 48 is now a dependent from claim 47 and as such is written in proper dependent form. Applicant requests that the Examiner's objection to this claim be lifted.

Claim Rejections Under 35 U.S.C. §103

Currently pending claims 1, 11, 16, 18, 23, 24, 25, 36-40 and 47-51 all stand presently rejected under 35 U.S.C. §103(a) as being unpatentable over Roehrig in view of Ema and Rogers.

Claim 1, as presently amended, further specifies that the first and second indications associated with each marker are determined by a computer implemented detection algorithm. By this clarifying amendment as well as the fact that it is improper to combine the Rogers, Roehrig and Ema references, presently amended claim 1 is believed allowable.

With respect to the cited references, Rogers recognizes that a diagnosing clinician's review of diagnostic images can be facilitated by allowing the clinician to electronically classify regions of interest (ROI) that have been determined by a computer aided detection/diagnosis (CAD) algorithm. Instead of recording his/her observations elsewhere, the diagnosing clinician can record them on an electronic file in conjunction with the digital diagnostic image. This facilitates the transfer of the diagnostic image and the resulting diagnosis.

Roehrig recognizes that CAD algorithms can be a quick and effective means for the identification and classification of ROIs in a diagnostic image. This provides the benefit of not requiring a clinician to review the images in order to classify each ROI, rather the results of the CAD may be sent directly to the clinician who will review and diagnose from the diagnostic images.

Ema, similarly to Roehrig, teaches that the application of CAD algorithms to a diagnostic image can be beneficial to a diagnosing clinician. In Ema, at least one CAD algorithm is applied to at least one diagnostic image, the at least one CAD algorithm identifying ROIs and listing them in a table and marking the locations on a diagnostic image. At least one CAD algorithm classifies the ROIs and this classification is recorded in the table. Similar to Roehrig, Ema teaches the beneficial use of a CAD system to aid the diagnosis by a diagnosing clinician.

The present invention, however, recognizes that the diagnosing clinician can be further aided by an intermediary clinician who reviews the results of a CAD algorithm ROI classification. The intermediary clinician reviews the results from the CAD algorithms and can modify those results if the clinician determines modification is necessary. Only after this initial review and modification is the diagnostic image forwarded to the diagnosing clinician for the review and diagnosis from the diagnostic images.

It is improper to combine the Rogers, Roehrig, and Ema references because each teach a parallel process to that presently claimed, yet do not teach that they may be combined. Namely, while Rogers teaches the annotation of a diagnostic image by a clinician, Rogers does not teach that annotation can be made to improve upon the quality of the results from already applied CAD algorithms that classify diagnostic image ROIs. Conversely, when Roehrig teaches that CAD algorithms may classify diagnostic image ROIs, Roehrig also teaches that this system is preferable to a system in which only a clinician reviews the diagnostic images. See Roehrig [0003]. Therefore, there is no motivation to combine the Roehring, Rogers, and Ema references in rejecting the presently amended claim 1 as the system and methods disclosed in Rogers result in a diagnostic image with computer identified ROIs which can receive digital annotations, Roehrig discloses a system and method of computer aided detection and diagnosis, and Ema discloses a computer aided detection and diagnosis system and method. Yet none of these teach that clinician review and modification of the CAD results can provide a beneficial improvement to the diagnostic images provided to a diagnosing clinician.

As each of the cited references already aim to provide the diagnosing clinician with an improved viewing experience, none of them teach or would motivate one to create an additional layer of clinician interpretation prior to the review by the diagnosing clinician. This motivation only comes from the disclosure of the present application. As such, it is improper to combine the Rogers, Roehrig, and Ema references to reject presently amended claim 1.

Claims 36, 37, 47, and 48 all depend directly and/or indirectly from presently amended claim 1, which is herein believed allowable. As such, claims 36, 37, 47 and 48 are also believed allowable for the reasons stated above as well as the subject matter recited therein.

Presently amended claim 16 claims a system for displaying a number of unique locations of pathological interest of an anatomical feature. Claim 16 has been amended to more particularly point out and claim that which is regarded as the invention. The elements of the presently claimed system combine to form a system in which computer implemented detection algorithms are applied to an image of an anatomical feature, markers identifying both the location of a detected region of pathological interest as well as a classification thereof are applied to the image, a clinician uses a user input device to select and modify the markers and classifications as determined by the computer implemented detection algorithm and a network facilitates the transfer of the image with

the modified markers to a diagnosing clinician who reviews the image with the modified markers to diagnose a patient's condition.

As stated extensively above, Roehrig, Rogers, and Ema each fail to teach the system as claimed and in combination fail to teach or to motivate one to create a system in which the results of the application of computer implemented detection algorithms are first reviewed and modified by a clinician before being sent to a diagnosing clinician that will make clinical use of the image of the anatomical feature.

Therefore, presently amended claim 16 is believed allowable over the cited Rogers, Roehrig, and Ema references.

Claims 18, 23-25, 50 and 51 all depend directly and/or indirectly from presently amended independent claim 16 which is believed allowable. As such, dependent claims 18, 23-25, 50 and 51 are also believed allowable for the reasons stated above as well as the subject matter recited therein.

Newly presented claim 55 has been drafted to more particularly claim and point out that which is regarded as the invention and as disclosed in the present application. Newly presented claim 55 claims a method of annotating a diagnostic image. The method includes the steps of applying a computer aided diagnosis algorithm to the diagnostic image, identifying each region of interest with the uniquely identified marker, presenting the diagnostic image and at least one uniquely identified marker to a first clinician for review, receiving an input from the first clinician, modifying the visual appearance of the uniquely identified marker according to the input from the first clinician, storing the modified uniquely identified marker, and presenting the diagnostic image in at least one modified uniquely identified marker to a second clinician for diagnosis.

As drafted, newly presented claim 55 is distinguished from the references cited by the Examiner, nor would one skilled in the art be motivated to create the invention as claimed after reading the cited references.

Newly presented claim 55 presents a novel and non-obvious method wherein the output of applying a computer aided diagnosis algorithm to a diagnostic image is enhanced by an additional review and treatment by a clinician, wherein the clinician modifies any of the results of the computer aided diagnosis algorithm that the clinician determines to be incorrect. This allows the presently claimed method to present at the final steps a diagnostic image with uniquely identified markers of a higher quality than that which is previously available from the cited references. The

cited references fail to teach each of the elements of the method as claimed, and as shown above, there is no motivation to combine the Rogers, Roehrig, and Ema references in order to find claim 55 obvious.

Claims 56-58 depend directly and/or indirectly from newly presented independent claim 55. Each of claims 56-58 are also believed independently allowable as they further distinguish the presently claimed invention from the cited references. Specifically, claim 56 specifies that the computer aided diagnosis algorithm identifies a probability of cancer and a classification for each region of interest and the visual appearance of each marker is modified to reflect the computer aided diagnosis algorithm determination of probability of cancer and region of interest classification. These visual appearances are then modified by the first clinician in improving the region of interest, cancer probability, and classification determinations associated with the markers that is then later presented to a second clinician for diagnosis. None of the cited references teach a method that includes an intermediary review by a clinician to improve the quality of the information presented by the markers on the diagnostic image to the clinician who will perform the diagnosis.

Furthermore, as addressed above, there is no motivation to combine the cited Rogers, Roehrig and Ema references to find claims 56-58 obvious.

Additionally, presently amended claims 11, 14, 38-40 and 49 all dependent directly and/or indirectly from newly presented claim 55 which is believed allowable. Therefore, presently amended claims 11, 14, 38-40 and 49 are also believed allowable for the reasons stated above as well as the subject matter recited therein.

Claim 14 has been rejected under 35 U.S.C. §103(a) as being obvious over Roehrig in view of Ema, Rogers and Ozaki. Presently amended claim 14 depends directly from newly presented claim 55, and as such claim 14 is believed allowable for the reasons stated above as well as the subject matter recited therein.

Claim 14 is further believed allowable as, similar to the arguments above, there is no motivation to combine the Roehrig, Rogers, Ema, and Ozaki references in order to find obvious each and every element of the method as claimed in claim 14. There is no additional disclosure in the Ozaki reference that would further motivate one skilled in the art to combine any of the Rogers, Roehrig, or Ema references to create a method whereby an intermediary clinician reviews the results of a computer aided diagnosis algorithm applied to a diagnostic image in order to improve

the quality of the markers on the diagnostic image as is it presented to a second clinician for a diagnosis. Therefore, claim 14 is believed allowable over the Roehrig, Rogers, Ema, and Ozaki references.

Conclusion

By the present amendment and the reasons stated above, the present application is believed to be in a condition for allowance with claims 1, 11, 14, 16, 18, 23-25, 36-40, 47-51, and 55-58. Such action is earnestly requested.

Respectfully submitted,

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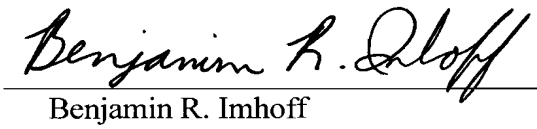
By 

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